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S. Hibben, et al

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This is a collection of brief abstracts on miscellaneous topics from the current Soviet technical literature. The intent is to supply a quick look at items of possible interest, including topics not necessarily named in the DARPA interest profile, as a supplement to our reportage on specified topics.

It is intended to publish this collection on a monthly basis, to continue to provide prompt coverage of numerous aspects of Soviet R&D. As an added feature, all recently acquired books will be listed as they are received. A list of source abbreviations is appended.

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Tel: (301) 770-3000
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Tel: (301) 770-3000
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Informatics Inc
Systems and Services Company
6000 Executive Boulevard
Rockville, Maryland 20852
(301) 770-3000 Telex: 89-521

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INTRODUCTION

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For further information the reader is invited to call Stuart Hibben or Lee Boylan at Informatics on (301)-770-3000.

Seawater Photoluminescence in the Tropical Atlantic (abstract)

This brief article details some more results of the optical tests reported by the authors earlier (SOVRaD, 1, 1, 8). An empirical formula is given expressing intensity of photoluminescence as a function of depth down to 250 meters, i.e. the interval over which photoluminescence tends to increase. Contribution of both biological and hydrological factors is discussed, with detritus of phytoplankton being a major determinant. Within the tested area, including the Eastern Caribbean and part of the Sargasso Sea, five discrete types of photoluminescence characteristics could be identified, which are illustrated graphically. [Karabashev, G. S. and A. N. Solov'yev. Distribution laws governing photoluminescent intensity of sea water in the active layer. FAiO, no. 8, 1974, 898-899].

Photoluminescence Variation in the Active Ocean Layer (verbatim)

In the spring of 1972 fluorimetric readings were taken at 87 stations in the western Atlantic, to measure vertical distribution in intensity of photoluminescence (IP) in seawater. Analysis of the IP profile showed that its form can be approximately expressed by a logistic function of the type $I = A(1 + 10^{a-bz})^{-1} + B$, where I is IP at depth z; B is the level from which IP growth starts; A is the spread between upper and lower measurement limits of IP; and a and b are constants. The approximation agrees with actual IP in inverse proportion to the level of dynamic processes in the particular test area of the ocean. In the case of strong turbulence, random deviations of IP from the plotted curve of the foregoing function are observed; in upwelling regions the approximation error is maximum and has a systematic character. To explain the IP profile a hypothesis is advanced, according to which the vertical behavior of IP reflects characteristics of formation and distribution of dissolved humus; the parameter b in the equation relates to the constant of kinetic reaction of biochemical decomposition P and its sedimentation rate, V, by the expression $b = P/V$. [Karabashev, G. S., and A. N. Solov'yev. Laws of spatial distribution of photoluminescence intensity in the active ocean layer. Moskva, 1974, 17 p. (RZhGeofiz, 7/74, no. 7V120 DEP)].

Optical Absorption in Seawater (verbatim)

Intensity measurements of photoluminescence and spectral absorption of filtrates were made in 33 test probes in various areas of the Baltic Sea. Results show that in the 200-250 nm spectral range, absorption is a function both of nitrate ion content and of dissolved organic matter; while in the 250-410 nm range the latter absorption predominates, following an exponential law at longer wavelengths. In the measured wavelength range the correlation between luminous intensity and absorption measures 0.82--0.92, which confirms the continuous determinant effect of organic matter on luminosity and absorption of seawater in the UV range. The similarity of optical characteristics is noted for organic matter occurring as trace additives in various types of natural waters. [Karabashev, G. S., and K. P. Zangalis. UV absorption and luminescence of matter dissolved in seawater. Moskva, 1974, 10 p. (RZhGeofiz, 7/74, no. 7V119 DEP)].

Measuring Angular Brightness Distribution Under Water (verbatim)

A general description is given of a scanning system for studying the spatial distribution of optical brightness under water. Practical realization of variants of this system suggests the possibility of developing simple and reliable light meters with high information content, for measuring angular distribution of optical brightness in oceans and other bodies of water. [Li, M. Ye., and N. P. Sherstyankin. Scanning in measurements of angular brightness distribution under water. IN: Sb. Movsk. gidrofiz. issled., no. 1(64) Sevastopol', 1974, 142-150. (RZhF, 12/74, no. 12A261)].

Laser Meter for Water Scattering Index (verbatim)

A meter is described for measuring optical scattering index in water, giving continuous and simultaneous response at ten fixed angles in a range from 20' to 5--7°. A He-Ne laser is used at 0.63μ; measurement error is $\pm$ 5%. [Belogol'skiy, V. A., A. M. Trokhan, L. M. Samorukova, and Ye. N. Levina. Device for measuring scattering index of a water medium. IN: Tr. VNII fiz-tekhn. i radiotekhn. izmereniy, no. 14(44), 1974, 65-68 (RZhMetrolog, 12/74, no. 12.32.1234)].

Optical Studies in the Black Sea (abstract)

Many areas of the Black Sea have layers exhibiting reduced transparency at depths of 100-180 meters, where there is a layer of suspended matter "supported" by upward flows. Studies using transparency meters have revealed that these layers often are [optically] detectable only when the instrument is moving, and transparency seems to vanish when the instrument is not in motion. These layers are thought to be related to large zooplankton which are frightened by the instrument. In situ spectral measurements of extinction indicate an increase with depth of some substances which selectively attenuate shortwave radiation.

Spectral curves for the vertical extinction coefficient and the "color index" values (ratio of luminances of light exiting the sea at the 540 and 450 mμ wavelengths) indicate a high yellow-substance content in the Black Sea. The corresponding attenuation factor is approximately 10 times greater than for the central tropical Atlantic, and three times greater than for the northwestern Mediterranean Sea. [Neuymin, G. G. Optical studies of Black Sea water. IN: Materialy Vses. simpoz. po izuchennosti. Chern. i Sredizemn. morey, ispol'z. i okhrane ikh resursov. Sevastopol', 1973, Part I. Kiev, Naukova Dumka, 1973, 81-83 (RZhGeofiz, no. 5, 1974, Abs 5V104)].

Underwater Sound Scattering (verbatim)

A compilation of theories on the reflection and scattering of sound from an uneven sea surface is presented. A discussion is given of the main classical and probabilistic models of these phenomena, as being essential to the understanding of sonic scatter underwater. Experimental results are compared with theory. [Dera, J., Z. Klusek, and M. Brzozowska. Certain problems on the physics of the sea. Part 4: Scattering of underwater sound on a rough sea surface. Postepy fiziki i no. 2, 1974, 175-191 (RZhF, 10/74, no. 10Zh520)].

Underwater Acoustic Holography (verbatim)

Possibilities are examined for using principles of acoustic holography in developing systems for underwater research. Achievements and advantages of such systems are evaluated. [Yeroshin, V. I.; G. P. Novikov, Zh. Sharshenaliyev, and A. M. Maripov. On using holographic principles in acoustic systems for underwater research. IN: Tr. Frunz. politekh. in-ta, no. 66, 1973, 91-99 (RZhF, 10/74, no. 10Zh505)].

Monograph on Oceanology (abstract)

This is an engineering text on fundamental physical and chemical properties of seawater and ice. Stress is placed on dynamics of sea water, particularly on wind waves and on oscillations of levels and flows. The main chapter headings are:

Ch. 1 - Chemical and physical properties of seawater
Ch. 2 - Sea ice
Ch. 3 - Sea organisms and their effect on hydrotechnical structures
Ch. 4 - Sea waves
Ch. 5 - Oscillation in levels of oceans and seas; the tide phenomenon
Ch. 6 - Ocean currents
Ch. 7 - Relief and geology of ocean and sea bottoms

[Smirnov, G. N. Okeanologiya. Uchebnik dlya vtuzov (Oceanology. Textbook for technical students). Moskva, Izd-vo Vysshaya shkola, 1974, 342 p. (LC)].

New Center for Dolphin Study (abstract)

A new dolphin aquarium presently under construction at Batumi, Georgia, the first of its kind in Russia and designed to be the largest in Europe, evidences a growing interest in the peculiar capabilities of dolphins. The Moscow Institute of Developmental Animal Morphology and Ecology has been conducting numerous scientific experiments with dolphins at the Black Sea base at Bol'shoy Utrish; the pilot base is jointly administered by the Institute and Moscow State University.

One experiment under way is to enhance the smell and taste systems of the dolphin, which appear to be vestigial at best. Training tests with citric acid and tincture of valerian have shown that dolphins can learn to distinguish extremely dilute solutions of these fluids, by taste, even in concentrations below normal human threshold. Another program for studying the dolphin's sleep habits has established that both halves of the brain remain active, rather than only one half as generally believed. The brief sleep intervals are compared to somnambulism, since the dolphin remains in constant motion throughout. [Malinov, A. The days of a dolphin. Nedelya, no. 37, (Sept. 9-15), 1974, 6-7].

New Towed Body Configuration (verbatim)

A new towed sensor package developed by the Marine Hydrophysical Institute of the Ukrainian Academy of Sciences was displayed at a recent Moscow exhibit. This "fish", designated Nyrok-2, will be used to study the spatial distribution of temperature and conductivity in the ocean's surface layer. A photo of Nyrok-2 accompanies the brief article. [Balan, V. V. Commemorative exhibition. Zemlya i vselennaya, no. 5, 1974, 72-73.].

Possibilities for a Gamma Laser (verbatim)

It is shown that the problem of developing a γ - laser based on long-lived isomers essentially reduces to obtaining a sufficiently fine Mossbauer line. The possibility of achieving this is considered by applying various methods of nuclear magnetic resonance, using internal fields in magnetically - ordered materials. [Khokhlov, R. V., and Yu. A. Il'inskiy. Possibility of developing a γ laser. IN: Sb. Nelineyn. protsessy v optike. Novosibirsk, 1973, 3-8 (RZhF, 11/74, no. 11D987)].

Plasmadynamic Laser Theory (abstract)

The concept of a plasmadynamic laser, in which population inversion is obtained from atomic transitions in an expanding plasma, has been considered for a number of years but neglected in favor of the more conventional gasdynamic types. The authors reexamine the theoretical considerations of a plasma flow design, mainly in view of its possibilities for extending the lasing wavelength down to the visible and UV ranges. A method is developed for calculating a plasmadynamic laser, based on quasistationary analytical functions of population distribution in the various energy levels. From this it is concluded that such a laser could work effectively by using a collision mechanism for depopulating the lower working level; this would permit use of a large enough lasing volume to get effective action. Theoretical examples based on hydrogen, lithium, helium and beryllium plasmas are included. [Reshetnyak, S. A., and L. A. Shelepin. Plasmadynamic lasers. ZhTF, no. 2, 1974, 1724-1732].

Seismic Holography (abstract)

An experiment in acoustic holography is described which demonstrates its possible use in seismic applications. A 100 x 100 x 200 mm parallellepiped of paraffin was used as the model, containing two small orthogonal cylindrical cavities as discontinuities. The mass was excited on one face by a piezoelement at 0.8 MHz; the resulting interference pattern was registered by piezo sensors on the rear face of the paraffin block, with a laser beam being used to form a hologram 25 x 25 mm in size on the rear face.

The reconstructed image revealed the two cylindrical discontinuities, although in somewhat distorted form. The authors analyze their results and point out ways of refining the reconstructed image. The experiment thus illustrates a technique that could be adapted for observing internal geological formations such as veins, inclusions or other pronounced discontinuities. The authors foresee further extension of the technique to core studies of the earth. [Vinogradov, S. D., A. V. Nikolayev, and P. A. Troitskiy. Ultrasonic seismic holography. DAN SSSR, v. 219, no. 1, 1974, 81-83].

Seismic Activity vs. Geomagnetic Disturbances (abstract)

An extended study of geomagnetic field variation versus surface earthquake activity from 1905 to 1953 shows a definite correlation of the two for strong surface quakes ($M > 7.9$). Results show a three year lag in seismic response to geomagnetic activity, identified as characteristic of a "slow"variations; a two-year lag relative to the known 11-year geomagnetic periodicity is also identified.

The author hence suggests that the so-called seismic energy equivalent obtained from planetary geomagnetic activity could be used for long-range prediction of Earth's seismic activity. It follows that the seismic equivalent for a specific region might be used for local prediction purposes. [Al'tgauzen, N. M. Correlation between geomagnetic disturbances and seismic activity of the Earth. GiA, no. 4, 1974, 698-701].

Electric Earth Probe (abstract)

Use of an MHD generator for deep earth sounding in the Pamirs is reported by the Academy's Institute of Terrestrial Physics. This recently developed technique is designed for situations in which conventional seismic sounding is undesirable or possibly hazardous in seismically active regions. Analysis of reflected signals yields information on internal structure which can be useful for earthquake prediction, for deep prospecting, and related subjects. In addition to being non-destructive the electric probe method has the advantages of high directionality and ready repeatibility.

The MHD generator developed for tests in the Pamirs is described as generating 500 Mw pulses with pulse currents to 3,000 amperes. No further data are given, other than to predict that the operating depth should be capable of extension to 40-50 km. [Ivanov, I. B. MHD generator probes the Earth. Priroda, no. 11, 1974, 117].

Explosions to extend Karakum Canal to Caspian Sea (abstract)

Work is presently under way to broaden about 850 kilometers of the Karakum Canal to increase its flow capacity from 380 to 578 cubic meters per second. It is intended to open the entire present length of the canal to ship traffic, i.g., hydrofoils and barges. In an effort to extend the present canal to the Caspian oil region, explosives (type not specified) will be used. [Kucherenko, A. Docks in the sand dunes. Pravda, 8 Jan 1975, p. 6, col. 1].

High-Strength Graphite Whiskers (abstract)

Graphite whiskers with higher than 1,000 kg/mm^2 tensile strength in specimens less than 1 micron diameter have been obtained by deposition from hydrocarbon vapors at a pressure below atmospheric on refractory metal substrates, e.g., W, Re, Mo and Ta. The crystal growth rate was fastest when specimens were heated by irradiation with an ultrahigh pressure Xe arc lamp or a laser. Size and density of whiskers varied, depending on growth conditions. The use of catalysts was found to decrease strength. Morphology and electron microstructure of the whiskers and tensile strength tests are described. [Deryagin, B. V., D. V. Fedoseyev, A. V. Lavrent'yev, and I. G. Varshavskaya. High-strength graphite whiskers. IN: Sb. Grafity i ikh primeneniye.Moskva, 1974, 30-32. (RZhKh, Silikat, mater., 19/74, no. 19M65)].

New Antenna Materials (verbatim)

Problems are reviewed on the construction of antennas using plastic and combined metals-plastic materials (bimaterials). Some dual-reflector antennas are described using for the main reflector a metallized fiberglass with polyester bonding, while the feed horn and auxiliary reflector were of bimaterials. The method permits a high precision in forming the curved surface and can be done at low cost. Results of some experimental studies with this type of antenna are discussed. It is concluded that this type of fabrication is very promising for antenna technology. [Yerukhimovich, Yu. A., and P. A. Litinskiy. Experimental use of nonmetallic materials and new technology in antenna construction. IN: Sb. Antenny, no. 19, Moskva, Izd-vo svyaz', 1974, 57-67 (RZhF, 11/74, no. 11Zh294)].

New Domain Structure in Garnet Epitaxy (abstract)

A new form of domain structure has been observed in films with a $Y_2BiFe_{3.8}Ga_{1.2}O_{12}$ composition, formed by liquid epitaxy on an Sm-Ga garnet substrate. In film specimens subjected to both diamond dust and chemical polishing the usual banded domains structure was observed; however when chemical polishing was omitted, a new structure was found to exist, with domain bands varying from 1 to 1000 μ and a coercivity of about 50 oe. With elastic repulsion evidently minimal between domains, it is possible to generate any desired domain configuration by applying local fields, or heating, to the film. Examples are given of stable images thus formed using a magnetic probe; analogous results were obtained by imaging with focused light from an incandescent bulb. The imaging possibilities of this film suggest uses such as an optical memory, holograph recording, etc. [Balbashov, A. M., A. Ya. Chervonenkis, A. P. Cherkasov, and V. Ye. Bakhteuzov. New type of domain structure in Y-Bi-Ga garnet epitaxial films. FTT, no. 10, 1974, 3102-3103].

Ablation of a Teflon Heat Shield (abstract)

Theoretical solutions are derived which define the ablation characteristics of a teflon heat shield on a blunt body of revolution, e.g. a reentry vehicle. The model used assumes a teflon coated sphere in hypersonic flows of various Mach numbers and dynamic flow pressures. Following a preliminary study of the equations of a laminar boundary layer with pressure gradient, the authors show that calculation of teflon destructive parameters reduces to solution of a set of nonlinear and transcendental equations. The temperature distribution and destruction rate over the body maintains a monotonic character, while the effective enthalpy of the material remains constant over the body. A simplified empirical formula is developed for approximate calculation of teflon ablation rate. [Prozorova, E. V., and B. I. Reznikov. Destruction of a teflon heat shield at hypersonic flight velocities. ZhPMTF, no. 4, 1974, 94-100].

High-Pressure Equation of State (verbatim)

The Hugoniot curve represents only a single line on the surface defining the state of a substance. Hence for interpreting shock wave data and for determining from this data a more complete equation of state, one can use any of several approximate variants to the equation of state. A detailed description is given for an equation of state using the Grunhausen approximation, and the limits of its applicability are indicated. [Roys, Ye. Determining the equation of state at high pressures from shock wave data. IN: Sb. Fizika vysokikh plotnostey energii. Moskva, Izd-vo Mir, 1974, 94-109 (RZhF, 10/74, no. 10G47)].

Long-Term Tape Storage (abstract)

Problems in maintaining data on magnetic tape for periods on the order of centuries are considered, with emphasis on hydrometeorological data. The case is considered solely in terms of deterioration in signal-to-noise ratio or, more exactly, of the probability at any future time that a recorded signal will be readable. The solution given is a combination of redundancy or anti-noise [sic] coding and retranscribing to a fresh tape every few years. As the present state of the art it is shown that by using a 2 year transcription period, one should be able to preserve digital data for 2,000 years with a readout error probability not worse than 10^{-9} to 10^{-11}, and this should improve as tape technology advances. The author notes, however, that error-free readout should not be the only criterion, but must be traded off against the coding cost, machine time, etc. used in any long-term protection scheme. [Afinogenov, L. P. Is long-term data storage on magnetic tape feasible? Metrologiya i gidrologiya, no. 11, 1974, 104-108.].

New Theory on Ball Lightning (abstract)

A theory advanced by I. P. Stakhanov is claimed to account for some of the puzzling phenomena of ball lightning. Stakhanov suggests that under certain conditions the presence of water vapor in the discharge path of a normal lightning stroke will inhibit the recombination of ions dissociated by the lightning discharge. This occurs because of the electric dipole nature of water molecules, such that they will be attracted to both positive and negative ions and form clusters around them. Complex cluster combinations, forming a so-called solvated molecule, could have compling energies on the order of several electron volts. Calculations show that if we assume 10^{19} particles per cc of air, then a lightning ball of 15 cm radius, for example, could thus have a stored energy on the order of 100 kilojoules, which is in the range of reported ball lightning observations.

Recombination does occur, but at a rate dictated by the degree of ion entrapment. Heat generated during recombination accelerates the breakup of the solvated molecules, releasing further heat, such that above some critical temperature ($\sim 1500^{\circ}$ C) the process avalanches, leading to the typical explosive end of the process. The criticality of the above conditions explains why ball lightning is so rarely observed; we in fact see it only when an exact density balance occurs at the start of ball formation, i. e., when there are four water molecules present for each ambient air molecule.

The theory admittedly leaves open some other questions, but would appear to account for both the high energy content and relatively long life of ball lightning. Furthermore the theory should be testable under laboratory conditions, which implies the possibility of man-made ball lightning. [Voronov, G. S. Ball lightning explosion leaves a wet spot. Khimiya i zhizn', no. 4, 1974, 56-57; Stakhanov, I. P. On the stability of ball lightning. ZhTF, no. 7, 1974, 1373-1379].

Open Resonator with Crossed Cylindrical Mirrors (abstract)

Experimental results with a cylindrical open resonator in the 8 mm band are described. By using crossed cylindrical reflectors the authors obtained encouraging performance, combining high Q with low diffractive loss and a relative insensitivity to reflector misalignment. Test data are given on resonator performance as a function of reflector area, curvature, spacing, angular offset, and operating wavelength. With proper selection of design parameters, stable operation is achieved in the 8 mm range with Q as high as 3×10^4; hence the crossed-mirror design is seen as promising for millimeter band applications. [Levin, G. Ya., O. A. Myshenko, V. D. Sakhatskiy, A. I. Borodkin, and S. A. Churilova. Open resonator with crossed cylindrical mirrors. RiE, no. 11, 1974, 2249-2256].

Pulsed E-Beam Generator (abstract)

A high-power electron accelerator recently put into operation at Tomsk Polytechnic Institute is briefly described. The accelerator is named Tonus, an acronym for Tomskiy nanosekundnyy uskoritel' (Tomsk nanosecond accelerator), and consists basically of a 2.2 Mv Marx bank, a coaxial pulse-forming line driving a field-emission cathode, a foil anode and a drift tube. A notable feature of the Tonus is the cathode configuration, consisting of a symmetrical array of seven circular plates each containing 2,000 tungsten needle emitters. Dimensions of the major elements are given. Preliminary test data show a 40 kiloampere pulse generated with 40 ns duration. Photos given include the accelerator section, the cathode assembly, and several examples of anode degradation based on various combinations of tungsten and tantalum anode foils. [Gleyzer, I. Z., A. N. Didenko, L. P. Dronova, et al. The Tonus nanosecond heavy-current accelerator. IN: Trudy nauchn.-issled. in-ta yad. fiz., elektron. i avtomat pri Tomsk. polit. in-te. No. 3, Moskva, Atomizdat, 1973, 86-89].

MHD Prospects (abstract)

A brief review of MHD power generation in the USSR lists some advantages as well as problems of present MHD technology. The Soviet showpiece is the U-25 MHD plant which is an open-cycle design now claimed to be operating stably at 7,000 kw output, with a design goal of 25,000 kw. Exhaust plasma from the converter stage at 2000° C is used to drive conventional turbogenerators, thus raising overall efficiency to 50--55%, or at least 10% better than standard thermal conversion plants. Advantages of MHD increase with power level; the directors of the Soviet MHD program foresee plants of up to 1,000,000 kw capacity in the very near future. [Golovachov, V. MHD- the modern way of generating electricity. Moscow News, no. 45, Nov. 16-23, 1974, 11].

Note: for a comprehensive review of U-25 operating specifications, see Teplofizika vysokikh temperatur (High Temperature Physics), no. 2, 1974.

Recent Publications

Kuchko, A. S. Aerofotografiya. Osnovy i metrologiya (Aerial photography. Basis and metrology). Moskva, Izd-vo Nedra, 1974, 221 p. (LC-VKP).

Zorin, Yu. A. (ed.) Seismologiya i seismogeologiya (Seismology and seismogeology). Sb. statey. SOAN SSSR, in-t zemnoy kory. Nauchn. informatsiya. Irkutsk, 1972, 53 p. (LC-VKP).

Katasonov, Yu. V. SShA: voyennoye programmirovaniye (USA: military programming). Moskva, Izd-vo Nauka, 1972, 227 p. (LC-VKP).

Dalin, S. A. SShA: poslevoyennyy gosudarstvenno-monopolisticheskiy kapitalizm (USA: Postwar governmental-monopolistic capitalism). Moskva, Izd-vo Nauka, 1972, 507 p. (LC-VKP).

Dresvin, S. V. (ed.) Fizika i tekhnika nizko-temperaturnoy plazmy (Physics and technology of low-temperature plasma). Moskva, Atomizdat, 1972, 352 p.

Gushchin, G. P. (ed.) Aktinometriya, atmosfernaya optika, ozonometriya (Actinometry, atmospheric optics, ozonometry). Leningrad, Gidrometeoizdat, 1972, 227 p. (LC-VKP).

Chalenko, G. G. (ed.) Okeanografiya. Sbornik statey (Oceanography. Collection of articles). Leningrad, Gidrometeoizdat, 1972, 107 p. (LC-VKP).

Kondrat'yev, K. Ya. (ed.) Radiatsionnyye issledovaniya v atmosfere. Sbornik statey. (Radiation studies in the atmosphere. Collection of articles). Leningrad, Gidrometeoizdat, 1972, 255 p. (LC-VKP).

Molochnov, G. V., and A. S. Semenov (eds.) Voprosy geofiziki. Sbornik statey (Problems in geophysics. Collections of articles). Leningrad, Izd-vo Leningr. gos. in-ta, 1973, 246 p. (LC-VKP).

K'yukin, I. I. Zvuk i morye (Sound and the sea). Leningrad, Izd-vo Sudostroyeniye, 1974, 239 p. (LC-VKP).

Shebalin, N. V. Seysmologiya - nauka o zemlyetryasen'yakh (Seismology - the science of earthquakes). Moskva, Izd-vo Znaniye, 1974, 64 p. (LC-VKP).

Ungerman, M. N., and P. K. Guber. Tekhnika okeanologicheskikh nablyudeniy na poiskovykh i promyslovykh sudakh. (Techniques of oceanological observations on research and commercial vessels). Moskva, Izd-vo Pishchevaya prom-st', 1973, 212 p. (LC-VKP)

Khrgian, A. K. Fizika atmosfernogo ozona (Physics of atmospheric ozone). Leningrad, Gidrometeoizdat, 1973, 291 p. (LC-VKP).

Levandovskiy, Ye. A., and V. I. Skotnidov. Laboratornyye pribory i elektronnyye bloki dlya yadernofizicheskikh issledovaniy (Laboratory devices and electronic units for nuclear physics research). Moskva, Atomizdat, 1973, 103 p. (LC-VKP)

Vol'vovskiy, I. S. Seysmicheskiye issledovaniya zemnoi kory v SSSR (Seismic studies of the earth's core in the USSR). Moskva, Izd-vo Nedra, 1973, 208 p. (LC-VKP).

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SOURCE IDENTIFICATION

DAN SSSR	-	Akademiya nauk SSSR. Doklady
FAiO	-	Akademiya nauk SSSR. Izvestiya. Fizika atmosfery i okeana.
FTT	-	Fizika tverdogo tela
GiA	-	Geomagnetizm i aeronomiya
LC-VKP	-	Library of Congress acquisition
RBL	-	Russian Book List entry
RiE	-	Radiotekhnika i elektronika
RZhF	-	Referativnyy zhurnal. Fizika
RZhGeofiz	-	Referativnyy zhurnal. Geofizika
RZhKh	-	Referativnyy zhurnal. Khimiya
RZhMetrolog	-	Referativnyy zhurnal. Metrologiya
ZhPMTF	-	Zhurnal prikladnoy mekhaniki i teoreticheskoy fiziki
ZhTF	-	Zhurnal tekhnicheskoy fiziki